

Attachment A

TRAFFIC AND TRANSPORTATION
COMMENT LETTERS

JOHN COLLINS ENGINEERS, P.C.

TRAFFIC-TRANSPORTATION ENGINEERS

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MEMORANDUM

DRAFT

TO: Mark Edsall, P.E.
FROM: Philip J. Grealy, Ph.D., P.E.
DATE: April 2, 2003
RE: Meadowbrook Estates
Town of New Windsor/Town of Cornwall, New York
PROJECT: No. 676

The following is our initial technical review of the Traffic Impact Study contained in the EAF dated December 20, 2002 for the above referenced development prepared by Tim Miller Associates, Inc.

- 1 o As we understand, the Traffic Study has been forwarded to NYSDOT for their review. Comments from the NYSDOT should be obtained.
- 2 o It appears that the Project has been reduced from some 181 single family homes to some 90 single family homes which is addressed in the Traffic Study.
- 3 o The EAF addressed the "Five Corners" intersection in Appendix "F". This Appendix was missing from our document and had subsequently been forwarded to our office. It should be confirmed that Appendix "F" was forwarded to the NYSDOT.
- 4 o The Existing Traffic Volumes appear reasonable.
- 5 o The Existing traffic volumes were grown by an appropriate background growth rate of 2% per year to a 2005 Design Year. Would a Design Year of 2007/2008 be more appropriate?

- 6 o Traffic for other proposed developments in the area was included as part of the No-Build Condition including traffic for The Reserve. However traffic for the recently approved Hannaford Supermarket was not included. A sensitivity analysis to include traffic for the Hannaford Supermarket should be provided. This may be significant for the Route 94 and Meadowbrook Road (East) intersection.
- 7 o Access to the project is proposed to Meadowbrook Road (via Route 94) and through The Reserve. It appears by the site distribution figure (Figure 8) that 45% of the traffic will arrive and depart through The Reserve with 25% via Mt Airy Road and 20% via a new roadway (Independence Drive). Noting the above, the following should be considered:
- 8 • Based on the review of the existing roadway network and existing traffic volumes, the 45% to/from Bethlehem Road appears to be high. Confirmation of the arrival and departure patterns should be provided. Depending on this information, a sensitivity analysis may be necessary assuming more traffic to/from the Meadowbrook Road access (Via Route 94).
- 9 • Assuming the 45% through The Reserve, the time frame for the completion and opening of the new roadway may be critical, especially since the Design Year for the Meadowbrook Estates project is 2005. Depending on the time frame of The Reserve and the time frame of the new roadway, a sensitivity analysis assuming all site traffic utilizing Meadowbrook Road may be required.
- 10 o Also, there the potential for some of The Reserve traffic to access Route 94 through Meadowbrook Estates. A sensitivity analysis should be conducted assuming more traffic to/from the Meadowbrook Road access (Via Route 94).

- 11 o Meadowbrook Road (East) currently intersects Route 94 at an acute angle. The Applicant is proposing to realign the Meadowbrook Road east approach to improve current conditions. Based on the information provided, it appears that acceptable sight distance will be provide at the reconfigured Route 94/Meadowbrook Road (East) intersection with the proposed realignment of this intersection. The final configuration of this intersection will have to be reviewed with the NYSDOT.
- 12 o Traffic Study indicates that the improvements to the intersection of Route 94 and Mount Airy Road/access to the Cornwall High School are anticipated to be in place prior to the opening of the High School.
- 13 o The Traffic Study indicates that a separate left turn lane on Route 94 into Meadowbrook Road (East) would not be required. However, in consideration of the above distribution comments and additional traffic growth comments, the left turn lane requirement may have to be re-evaluated.
- 14 o The Traffic Study indicates that the Route 94/Jackson Road intersection will operate at a Level of Service "F" with and without the proposed development. The Traffic Study also indicated that to improve the operation of this intersection, a traffic signal would be required under future conditions. This intersection should be monitored in the future to determine if traffic signal warrants will be met. In addition, depending on the above distribution comments and additional traffic growth comments, this intersection may have be re-evaluated.

- 15 o As an editorial comment, on page 15 under heading 5.2 Build Level of Service, the opening sentence of "the proposed Meadowbrook Estates will be contributing 19 trips in the AM Peak and 24 trips in the PM peak" is unclear. Does this refer to the Route 94 and Meadowbrook Road (west) intersection. As noted on Table 8, the Project will generate a total of 73 AM trips and 97 PM trips to the area roadway network.
- 16 o Figure 10 should show the Site Generated PM Peak Hour Traffic not the Build PM Peak Hour Traffic.

The above comments need to be addressed before we can finalize our review.



STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
4 BURNETT BOULEVARD
POUGHKEEPSIE, N.Y. 12603

ROBERT A. DENNISON III, P.E.
REGIONAL DIRECTOR

JOSEPH H. BOARDMAN
COMMISSIONER

May 15, 2003

Mr. James Petro, Chairman
Planning Board
Town of New Windsor
555 Union Avenue
New Windsor, New York 12553-6196

Re: Draft Environmental Impact Statement
Meadowbrook Estates
Town of Cornwall/Town of New Windsor
Orange County

Dear Mr. Petro:

We have completed our review of the traffic and transportation impacts contained in the Draft Environmental Impact Statement for the referenced project and have the following comments to offer:

- 1) The methodology utilized in the traffic impact study including the existing traffic volumes, trip generation rates, trip distribution rates, 2% growth rate, no-build traffic volumes and resulting build traffic volumes is acceptable.
- 2) The Department is currently working on improvements to Route 94 (PIN 804110, from Reily Rd. to Rte. 32) within the vicinity of the referenced project. We suggest that Mr. Martin Evans of our Design Group (845-431-5865) should be contacted to incorporate any changes to the Department's plans as part of this project.
- 3) Elimination of the existing Old Route 94 West/Route 94 intersection, realignment of Old Route 94, safety related issues and the proposed location of realigned access to Route 94 would be reviewed by our Traffic Engineering and Safety Group as part of highway work permit process.
- 4) We would like to remind you that a State Highway Work Permit will be required for any curb cuts and/or work within the Route 94 right-of-way. An application and final site plans should be forwarded to this Department's local residency office, as soon as possible to initiate the review process.

If you have any questions or need additional information, we can be reached at (845)431-5793.

Very truly yours,

Akhter A. Shareef
Senior Transportation Analyst

Attachment B

SENSITIVITY ANALYSIS

ATTACHMENT B

Sensitivity Analysis Assumed Conditions

The Sensitivity analysis considered the cumulative effect of three changes in the traffic analysis volumes as described below:

1. Additional two percent per year for three years to 2008.
2. Additional No Build traffic from Hannaford Supermarket and Five Corners' area.
3. Increased traffic at the access to NYS Route 94 equivalent to rerouting all site traffic to/from Bethlehem Road toward NYS Route 300 via Five Corners. Reserve traffic going through the site is balanced by site traffic going through the Reserve development.

Traffic volumes for the sensitivity analysis including No Build, site distribution, site generated traffic, Build Condition are shown in Attachment C using the figure numbers corresponding to the EAF figures.

Sensitivity Analysis Results

Table 1 shows the resultant levels of service for the Build condition assuming the above sensitivity changes.

Mount Airy/NYS Route 94 signal timing in the AM peak would need to be adjusted to address additional through traffic to maintain D or better. The PM peak hour remains level of service C or better.

NYS Route 94 Meadowbrook East (old Route 94) southbound level of service declines one service level compared to the Build Condition. The AM peak hour level of service C becomes D and the PM peak hour level of service D goes to E.

NYS Route 94 Meadowbrook West (old Route 94): no change in level of service from the Build Condition.

NYS Route 94/Jackson Avenue intersection had level of service F in No Build without additional traffic. The redistribution of site traffic does not add any site traffic to this intersection. If signalized, mitigation for AM peak hour would remain unchanged at level of service B. The PM peak hour would be level of service C or better. Additional green time for through movement would compensate for additional through traffic.

Bethlehem Road /Mt Airy: This was level of service B or better in the Build Condition. Above analysis assumptions reduce traffic in this location so no further analysis was done.

Orrs Mill Road/Jackson Avenue: no change in level of service between the Build Condition and the Sensitivity Condition.

Level of service calculations are shown in Attachment D.

TABLE 1
Sensitivity Analysis Build Condition Level of Service Summary

Intersection Roads	Lane Group (Approach Direction -Movement)	AM Weekday Peak Hour			PM Weekday Peak Hour		
		Volume to Capacity Ratio	Delay seconds/ vehicle	Level of Service	Volume to Capacity Ratio	Delay seconds/ vehicle	Level of Service
Mount Airy Road & NYS Route 94							
NYS Route 94	EB-L	0.04	9.9	A	0.58	28.4	C*
	EB-TR	0.96	47.1	D*	0.65	15.1	B
NYS Route 94	WB-L	0.87	51.1	D*	0.26	10.9	B*
	WB-TR	0.52	18.4	B	0.89	26.2	C*
Mt. Airy HS Drive	NB-LTR	0.54	29.9	C	0.71	27.4	C
Mt. Airy Road	SB-LTR	0.85	54.1	D	0.74	31.7	C
	Total		40.3	D*		23.5	C*
NYS Rt. 94 & Meadowbrook Rd (East)							
NYS Route 94	EB-LTR	0.01	8.2	A	0.02	9.5	A
	WB-LTR	0.00	9.3	A	0.00	8.8	A
Meadowbrook Rd.	NB-LTR	0.02	16.6	C	0.01	21.4	C
	SB-LTR	0.27	26.7	D*	0.30	42.1	E*
NYS Rt. 94 & Meadowbrook Rd (West)							
NYS Route 94	WB-LT	0.00	9.0	A	0.01	8.8	A
Meadowbrook Rd.	NB-LR	0.07	22.2	C	0.03	14.1	B
Orrs Mill Road & Jackson Avenue							
Orrs Mill Road	EB-LTR	0.01	7.7	A	0.02	8.2	A
	WB-LTR	0.00	7.9	A	0.00	7.5	A
Jackson Avenue	NB-LTR	0.10	13.3	B	0.15	14.9	B
	SB-LTR	0.54	21.2	C	0.41	18.9	C
NYS Rt. 94 & Jackson Ave. (w/ signal)							
NYS Route 94	EB-LTR	0.72	17.2	B	0.73	14.3	B
	WB-LTR	0.47	11.8	B	0.76	14.7	B
Jackson Avenue	NB-LTR	0.30	16.2	B	0.59	26.9	C*
	SB-LTR	0.44	18.4	B	0.50	23.5	C*
	Overall		15.8	B		16.9	B
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound							
L = left, R = right, T = through, TR = through and right, (e.g. WB-L = Westbound left):							
* Indicates a decline in the level of service from Build Condition.							
Italics denotes signalized intersection.							

Attachment C

SENSITIVITY ANALYSIS TRAFFIC
VOLUMES FIGURES

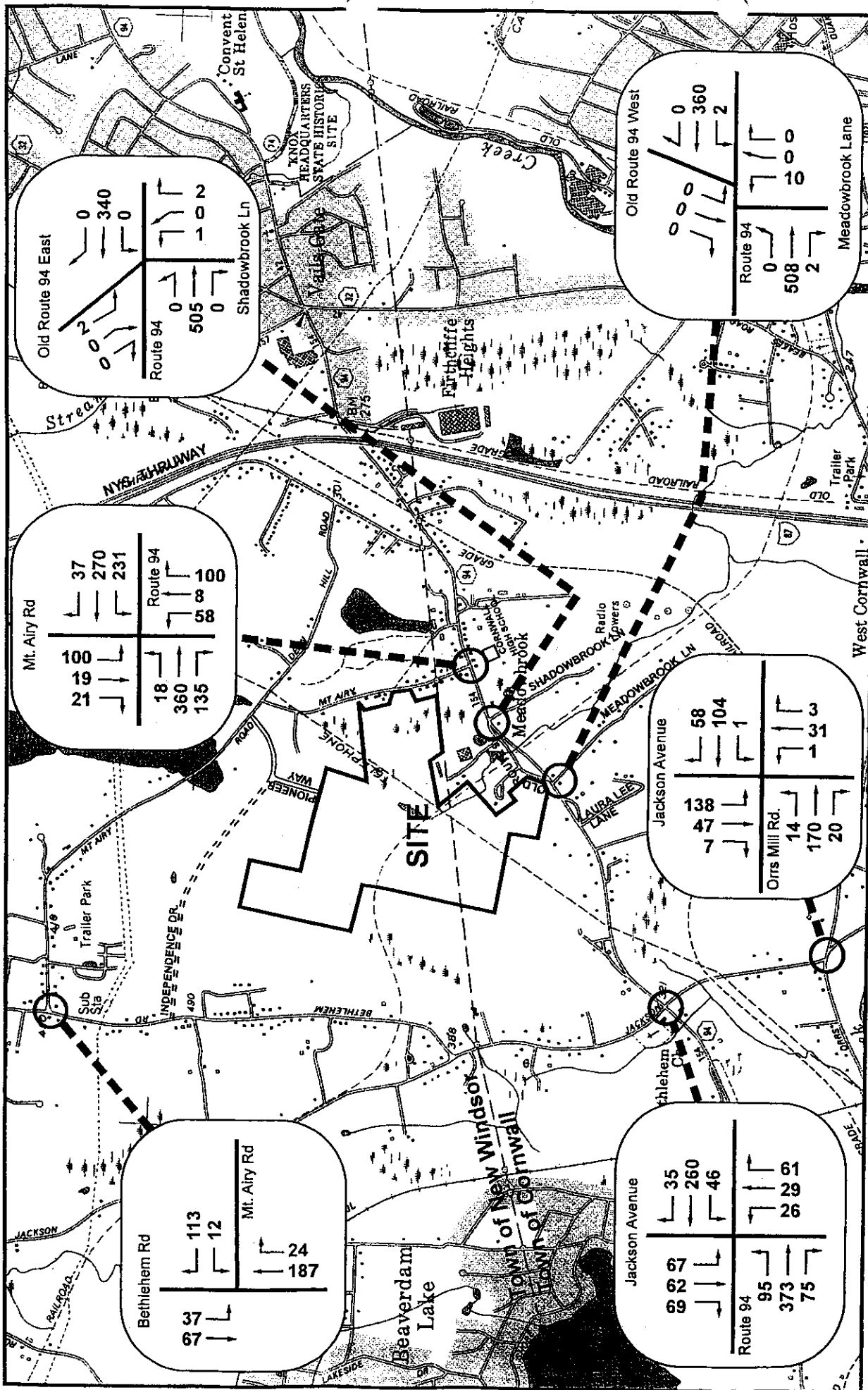
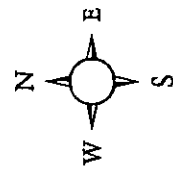
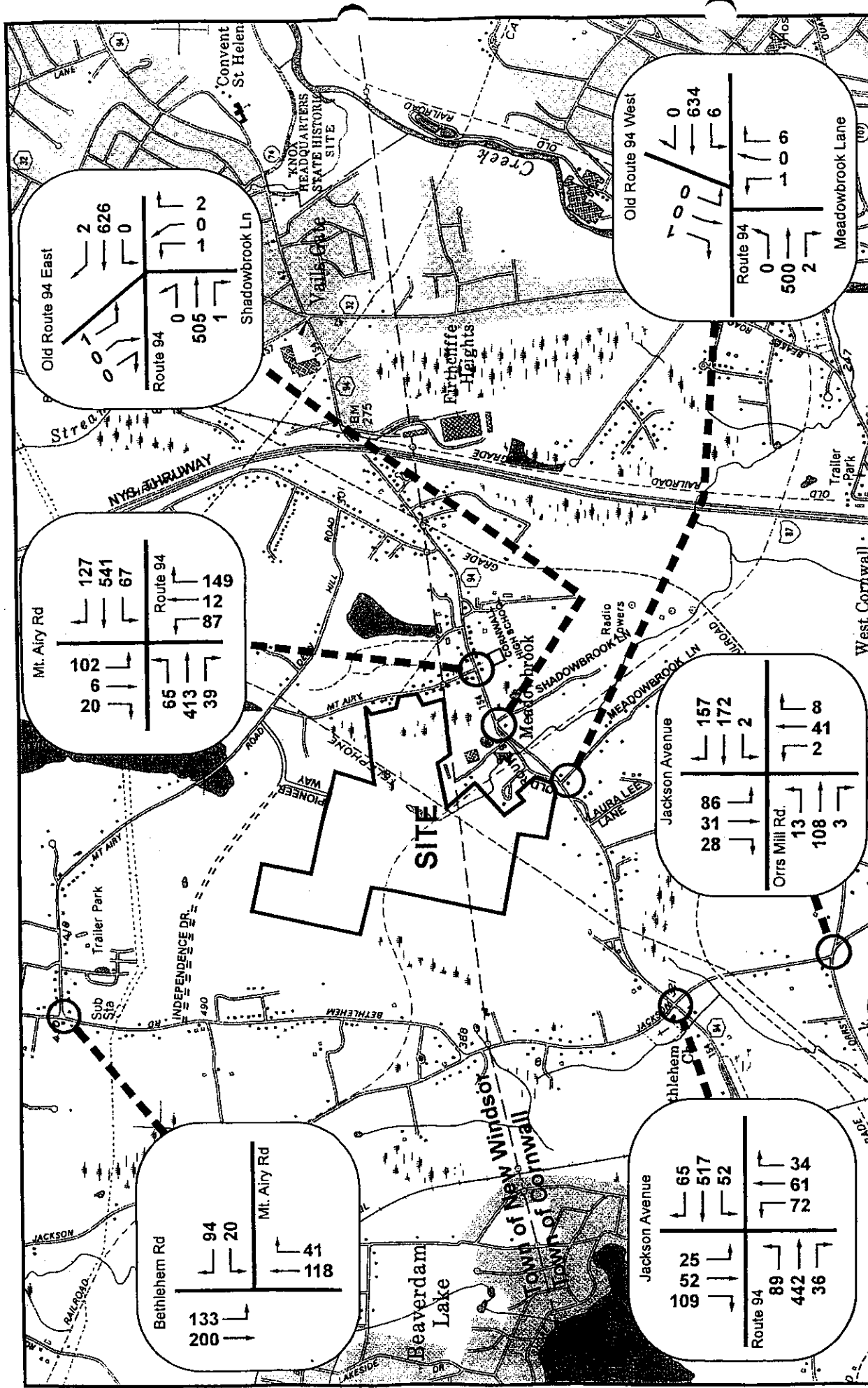
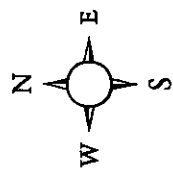
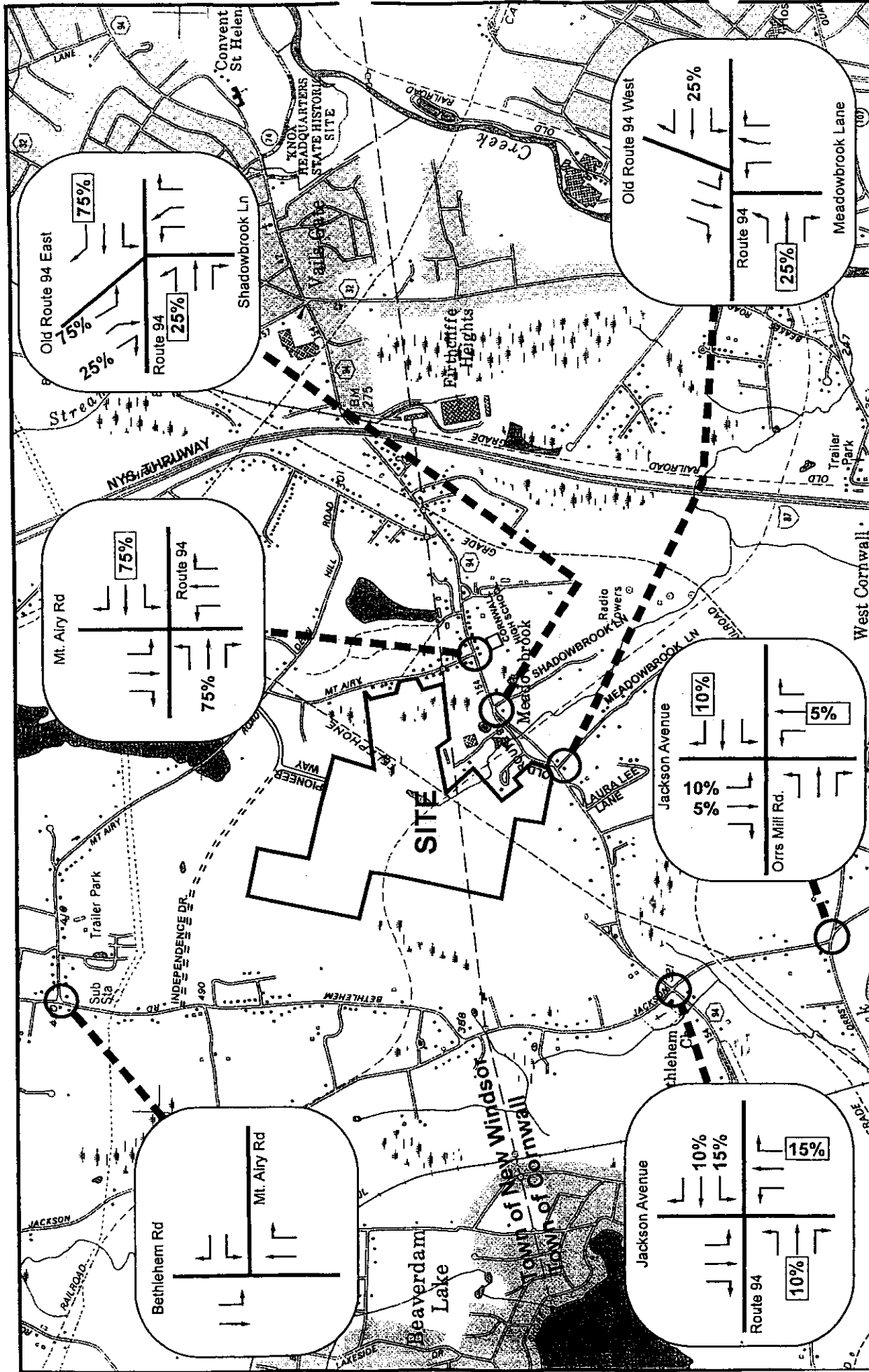


Figure 4: Sensitivity No Build AM Peak Hour Traffic
Meadowbrook Estates
Towns of New Windsor and Cornwall, Orange County, New York
Base Map: NYSDOT Cornwall Planimetric Quad Map, 1985
Scale: 1" = 2000'



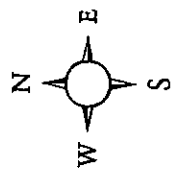
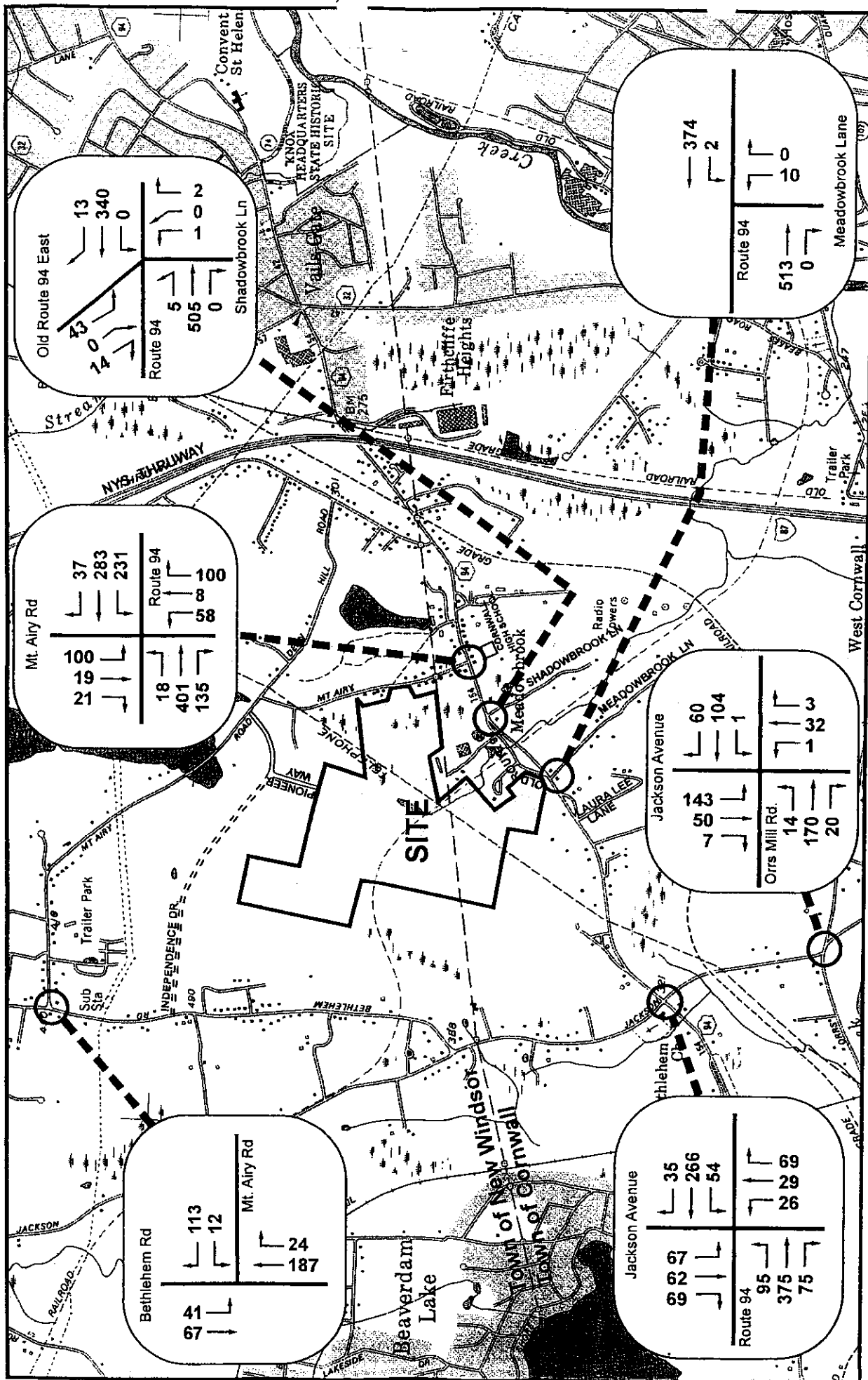
○ Intersections Studied

Figure 5: Sensitivity No Build PM Peak Hour Traffic
 Meadowbrook Estates
 Towns of New Windsor and Cornwall, Orange County, New York
 Base Map: NYSDOT Cornwall Planimetric Quad Map, 1985
 Scale: 1" = 2000'



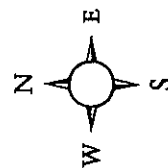
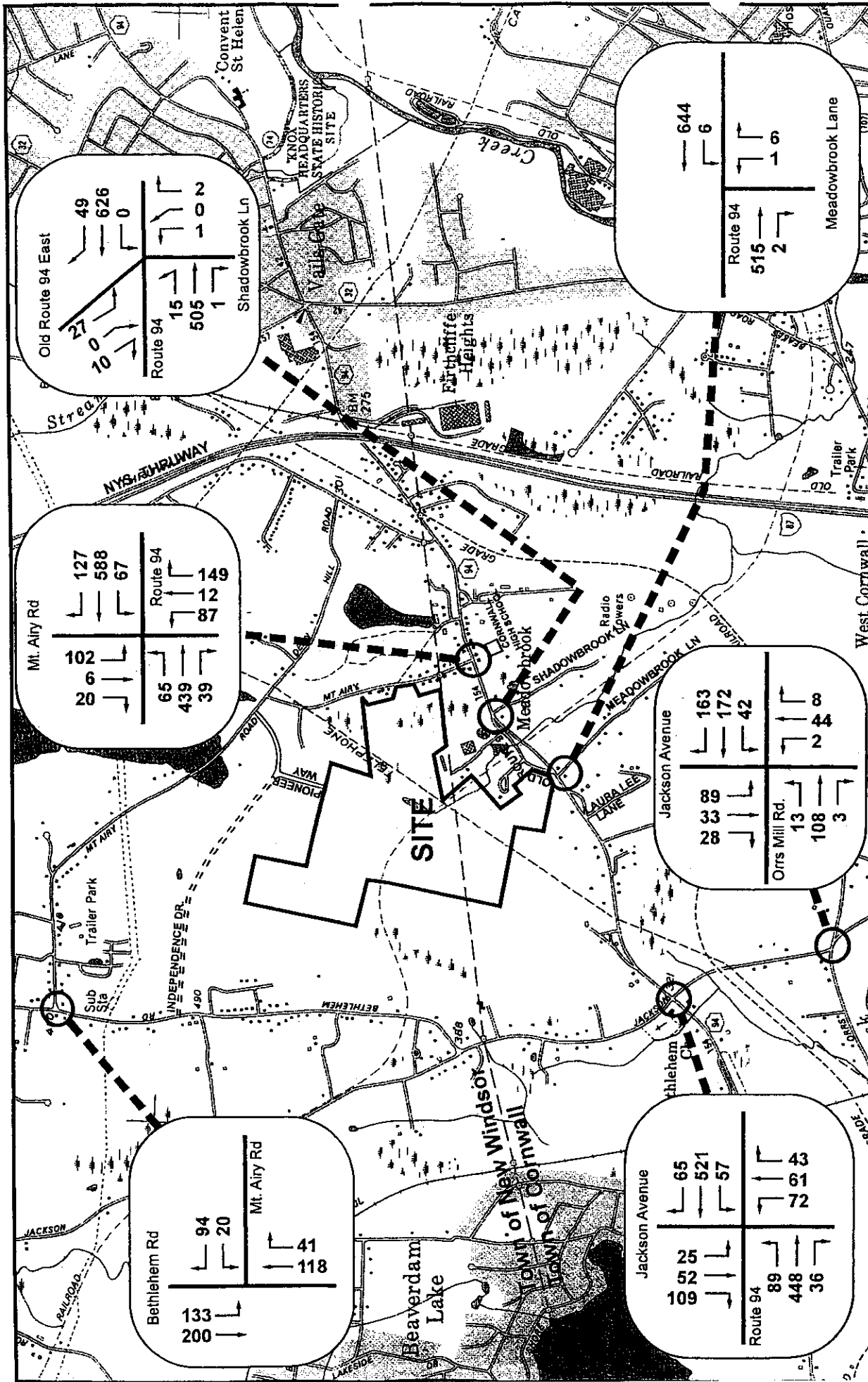
- Intersections Studied
- XX Inbound Traffic
- XX Outbound Traffic

Figure 8: Sensitivity Site Distribution AM and PM Peak Hour Traffic
 Meadowbrook Estates
 Towns of New Windsor and Cornwall, Orange County, New York
 Base Map: NYSDOT Cornwall Planimetric Quad Map, 1985
 Scale: 1" = 2000'



○ Intersections Studied

Figure 11: Sensitivity Build AM Peak Hour Traffic
 Meadowbrook Estates
 Towns of New Windsor and Cornwall, Orange County, New York
 Base Map: NYSDOT Cornwall Planimetric Quad Map, 1985
 Scale: 1" = 2000'



○ Intersections Studied

Figure 12: Sensitivity Build PM Peak Hour Traffic
Meadowbrook Estates
Towns of New Windsor and Cornwall, Orange County, New York
Base Map: NYSDOT Cornwall Planimetric Quad Map, 1985
Scale: 1" = 2000'

Attachment D

LEVEL OF SERVICE
CALCULATIONS

HCS2000™ DETAILED REPORT												
General Information						Site Information						
Analyst JAG						Intersection Mt. Airy Road & Route 94						
Agency or Co. TMA						Area Type All other areas						
Date Performed 5/20/03						Jurisdiction Town of Cornwall						
Time Period AM Peak Hour						Analysis Year Build Sensitivity						
Project ID Meadowbrook Estates												
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_i	1	1	0	1	1	0	0	1	0	0	1	0
Lane group	L	TR		L	TR			LTR			LTR	
Volume, V (vph)	18	401	135	231	283	37	58	8	100	100	19	21
% Heavy vehicles, %HV	9	9	9	20	15	15	20	20	20	24	24	24
Peak-hour factor, PHF	0.77	0.77	0.77	0.87	0.87	0.87	0.85	0.85	0.85	0.61	0.61	0.61
Pretimed (P) or actuated (A)	A	P	P	A	P	P	P	P	P	P	P	P
Start-up lost time, I_i	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival type, AT	3	3		3	3			3			3	
Unit extension, UE	3.0	3.0		3.0	3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000		1.000	1.000			1.000			1.000	
Initial unmet demand, Q_b	0.0	0.0		0.0	0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	11.0	11.0		11.0	11.0			13.0			10.0	
Parking / Grade / Parking	N	2	N	N	-2	N	N	2	N	N	-6	N
Parking maneuvers, N_m												
Buses stopping, N_B	0	0		0	0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		
Phasing	EW Perm		Excl. Left	03		04	NS Perm		06	07		08
Timing	G = 36.0		G = 6.0	G =		G =	G = 23.0		G =	G =		G =
	Y = 5		Y = 5	Y =		Y =	Y = 5		Y =	Y =		Y =
Duration of Analysis, $T = 0.25$						Cycle Length, $C = 80.0$						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	23	696		266	368			195			229	
Lane group capacity, c	554	722		307	713			358			269	
v/c ratio, X	0.04	0.96		0.87	0.52			0.54			0.85	
Total green ratio, g/C	0.59	0.45		0.59	0.45			0.29			0.29	
Uniform delay, d_1	9.9	21.4		29.1	15.8			24.1			26.9	
Progression factor, PF	1.000	1.000		1.000	1.000			1.000			1.000	
Delay calibration, k	0.11	0.50		0.40	0.50			0.50			0.50	
Incremental delay, d_2	0.0	25.8		22.0	2.7			5.8			27.2	
Initial queue delay, d_3												
Control delay	9.9	47.1		51.1	18.4			29.9			54.1	
Lane group LOS	A	D		D	B			C			D	
Approach delay	45.9			32.1			29.9			54.1		
Approach LOS	D			C			C			D		
Intersection delay	40.3						Intersection LOS			D		

TWO-WAY STOP CONTROL SUMMARY									
General Information					Site Information				
Analyst	JAG				Intersection	Rt 94 & Meadowbrook East			
Agency/Co.	TMA				Jurisdiction	Town of Cornwall			
Date Performed	5/20/03				Analysis Year	Build Sensitivity			
Analysis Time Period	AM Peak Hour								
Project Description Meadowbrook Estates									
East/West Street: Route 94					North/South Street: Meadowbrook Road				
Intersection Orientation: East-West					Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments									
Major Street	Eastbound			Westbound					
Movement	1	2	3	4	5	6			
	L	T	R	L	T	R			
Volume	5	505	0	0	340	13			
Peak-Hour Factor, PHF	0.73	0.73	0.73	0.88	0.88	0.88			
Hourly Flow Rate, HFR	6	691	0	0	386	14			
Percent Heavy Vehicles	9	—	—	16	—	—			
Median Type	Undivided								
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration	LTR			LTR					
Upstream Signal		0			0				
Minor Street	Northbound			Southbound					
Movement	7	8	9	10	11	12			
	L	T	R	L	T	R			
Volume	1	0	2	43	0	14			
Peak-Hour Factor, PHF	0.38	0.38	0.38	0.90	0.90	0.90			
Hourly Flow Rate, HFR	2	0	5	47	0	15			
Percent Heavy Vehicles	0	0	0	0	0	0			
Percent Grade (%)	1			2					
Flared Approach		N			N				
Storage		0			0				
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration		LTR			LTR				
Delay, Queue Length, and Level of Service									
Approach	EB	WB	Northbound			Southbound			
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LTR	LTR		LTR			LTR		
v (vph)	6	0		7			62		
C (m) (vph)	1122	842		318			227		
v/c	0.01	0.00		0.02			0.27		
95% queue length	0.02	0.00		0.07			1.07		
Control Delay	8.2	9.3		16.6			26.7		
LOS	A	A		C			D		
Approach Delay	—	—	16.6			26.7			
Approach LOS	—	—	C			D			

TWO-WAY STOP CONTROL SUMMARY									
General Information					Site Information				
Analyst	JAG				Intersection	Rt 94 & Meadowbrook West			
Agency/Co.	TMA				Jurisdiction	Town of Cornwall			
Date Performed	5/20/03				Analysis Year	Build Sensitivity			
Analysis Time Period	AM Peak Hour								
Project Description Meadowbrook Estates									
East/West Street: Route 94					North/South Street: Meadowbrook Road				
Intersection Orientation: East-West					Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments									
Major Street	Eastbound			Westbound					
Movement	1	2	3	4	5	6			
	L	T	R	L	T	R			
Volume	0	513	0	2	374	0			
Peak-Hour Factor, PHF	0.72	0.72	0.72	0.89	0.89	0.89			
Hourly Flow Rate, HFR	0	712	0	2	420	0			
Percent Heavy Vehicles	0	-	-	0	-	-			
Median Type	Undivided								
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration			TR	LT					
Upstream Signal		0			0				
Minor Street	Northbound			Southbound					
Movement	7	8	9	10	11	12			
	L	T	R	L	T	R			
Volume	10	0	0	1	1	1			
Peak-Hour Factor, PHF	0.63	0.63	0.63	0.25	0.25	0.25			
Hourly Flow Rate, HFR	15	0	0	0	0	0			
Percent Heavy Vehicles	0	0	0	0	0	0			
Percent Grade (%)	0			0					
Flared Approach		N			N				
Storage		0			0				
RT Channelized			0			0			
Lanes	0	0	0	0	0	0			
Configuration		LR							
Delay, Queue Length, and Level of Service									
Approach	EB	WB	Northbound			Southbound			
Movement	1	4	7	8	9	10	11	12	
Lane Configuration		LT		LR					
v (vph)		2		15					
C (m) (vph)		897		224					
v/c		0.00		0.07					
95% queue length		0.01		0.21					
Control Delay		9.0		22.2					
LOS		A		C					
Approach Delay	-	-	22.2						
Approach LOS	-	-	C						

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	JAG			Intersection	Orrs Mill / Jackson			
Agency/Co.	TMA			Jurisdiction	Town of Cornwall			
Date Performed	5/20/03			Analysis Year	Build Sensitivity			
Analysis Time Period	AM Peak Hour							
Project Description <i>Meadowbrook Estates</i>								
East/West Street: <i>Orrs Mill Road</i>				North/South Street: <i>Jackson Avenue</i>				
Intersection Orientation: <i>East-West</i>				Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	14	170	20	1	104	60		
Peak-Hour Factor, PHF	0.72	0.72	0.72	0.86	0.86	0.86		
Hourly Flow Rate, HFR	19	236	27	1	120	69		
Percent Heavy Vehicles	4	--	--	11	--	--		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration	LTR			LTR				
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	1	32	3	143	50	7		
Peak-Hour Factor, PHF	0.71	0.71	0.71	0.78	0.78	0.78		
Hourly Flow Rate, HFR	1	45	4	183	64	8		
Percent Heavy Vehicles	5	5	5	4	4	4		
Percent Grade (%)	10			-2				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration		LTR			LTR			
Delay, Queue Length, and Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (vph)	19	1		50			255	
C (m) (vph)	1373	1251		486			472	
v/c	0.01	0.00		0.10			0.54	
95% queue length	0.04	0.00		0.34			3.16	
Control Delay	7.7	7.9		13.3			21.2	
LOS	A	A		B			C	
Approach Delay	--	--	13.3			21.2		
Approach LOS	--	--	B			C		

HCS2000™ DETAILED REPORT												
General Information						Site Information						
Analyst JAG						Intersection Route 94 & Jackson Avenue						
Agency or Co. TMA						Area Type All other areas						
Date Performed 5/20/03						Jurisdiction Town of Cornwall						
Time Period AM Peak Hour						Analysis Year Build Signal Sensitivity						
Project ID Meadowbrook Estates												
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_i	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	LTR			LTR			LTR			LTR		
Volume, V (vph)	95	375	75	54	266	35	26	29	64	67	62	69
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.74	0.74	0.74	0.89	0.89	0.89
Pretimed (P) or actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up lost time, l_i		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	-2	N	N	2	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 30.0	G =	G =	G =	G = 20.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis, $T = 0.25$						Cycle Length, $C = 60.0$						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v		586			382			160			223	
Lane group capacity, c		812			812			535			506	
v/c ratio, X		0.72			0.47			0.30			0.44	
Total green ratio, g/C		0.50			0.50			0.33			0.33	
Uniform delay, d_1		11.7			9.8			14.8			15.6	
Progression factor, PF		1.000			1.000			1.000			1.000	
Delay calibration, k		0.50			0.50			0.50			0.50	
Incremental delay, d_2		5.5			2.0			1.4			2.8	
Initial queue delay, d_3												
Control delay		17.2			11.8			16.2			18.4	
Lane group LOS		B			B			B			B	
Approach delay	17.2			11.8			16.2			18.4		
Approach LOS	B			B			B			B		
Intersection delay	15.8						Intersection LOS			B		

HCS2000™ DETAILED REPORT												
General Information						Site Information						
Analyst JAG						Intersection Mt. Airy Road & Route 94						
Agency or Co. TMA						Area Type All other areas						
Date Performed 5/20/03						Jurisdiction Town of Cornwall						
Time Period PM Peak Hour						Analysis Year Build Sensitivity						
Project ID Meadowbrook Estates												
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N _i	1	1	0	1	1	0	0	1	0	0	1	0
Lane group	L	TR		L	TR			LTR			LTR	
Volume, V (vph)	65	439	39	67	588	127	87	12	149	102	6	20
% Heavy vehicles, %HV	6	6	6	10	3	3	20	10	20	6	6	6
Peak-hour factor, PHF	0.86	0.86	0.86	0.92	0.92	0.92	0.85	0.85	0.85	0.53	0.53	0.53
Pretimed (P) or actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up lost time, I _i	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of effective green, e	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival type, AT	3	3		3	3			3			3	
Unit extension, UE	3.0	3.0		3.0	3.0			3.0			3.0	
Filtering/metering, I	1.000	1.000		1.000	1.000			1.000			1.000	
Initial unmet demand, Q ₀	0.0	0.0		0.0	0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width	11.0	11.0		11.0	11.0			13.0			10.0	
Parking / Grade / Parking	N	2	N	N	-2	N	N	2	N	N	-6	N
Parking maneuvers, N _m												
Buses stopping, N _B	0	0		0	0			0			0	
Min. time for pedestrians, G _p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 30.0	G =	G =	G =	G = 20.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis, T = 0.25						Cycle Length, C = 60.0						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	76	555		73	777			291			241	
Lane group capacity, c	130	848		278	877			410			326	
v/c ratio, X	0.58	0.65		0.26	0.89			0.71			0.74	
Total green ratio, g/C	0.50	0.50		0.50	0.50			0.33			0.33	
Uniform delay, d ₁	10.6	11.1		8.6	13.5			17.5			17.7	
Progression factor, PF	1.000	1.000		1.000	1.000			1.000			1.000	
Delay calibration, k	0.50	0.50		0.50	0.50			0.50			0.50	
Incremental delay, d ₂	17.8	3.9		2.3	12.8			10.0			14.0	
Initial queue delay, d ₃												
Control delay	28.4	15.1		10.9	26.2			27.4			31.7	
Lane group LOS	C	B		B	C			C			C	
Approach delay	16.7			24.9			27.4			31.7		
Approach LOS	B			C			C			C		
Intersection delay	23.5						Intersection LOS			C		

TWO-WAY STOP CONTROL SUMMARY									
General Information					Site Information				
Analyst	JAG				Intersection	Rt 94 & Meadowbrook East			
Agency/Co.	TMA				Jurisdiction	Town of Cornwall			
Date Performed	5/20/03				Analysis Year	Build Sensitivity			
Analysis Time Period	PM Peak Hour								
Project Description <i>Meadowbrook Estates</i>									
East/West Street: <i>Route 94</i>					North/South Street: <i>Meadowbrook Road</i>				
Intersection Orientation: <i>East-West</i>					Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments									
Major Street	Eastbound			Westbound					
Movement	1	2	3	4	5	6			
	L	T	R	L	T	R			
Volume	15	505	1	0	626	49			
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.84	0.84	0.84			
Hourly Flow Rate, HFR	18	623	1	0	745	58			
Percent Heavy Vehicles	3	—	—	3	—	—			
Median Type	Undivided								
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration	LTR			LTR					
Upstream Signal		0			0				
Minor Street	Northbound			Southbound					
Movement	7	8	9	10	11	12			
	L	T	R	L	T	R			
Volume	1	0	2	27	0	10			
Peak-Hour Factor, PHF	0.75	0.75	0.75	0.90	0.90	0.90			
Hourly Flow Rate, HFR	1	0	2	30	0	11			
Percent Heavy Vehicles	0	0	0	0	0	0			
Percent Grade (%)	1			2					
Flared Approach		N			N				
Storage		0			0				
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration		LTR			LTR				
Delay, Queue Length, and Level of Service									
Approach	EB	WB	Northbound			Southbound			
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LTR	LTR		LTR			LTR		
v (vph)	18	0		3			41		
C (m) (vph)	816	952		222			137		
v/c	0.02	0.00		0.01			0.30		
95% queue length	0.07	0.00		0.04			1.17		
Control Delay	9.5	8.8		21.4			42.1		
LOS	A	A		C			E		
Approach Delay	—	—	21.4			42.1			
Approach LOS	—	—	C			E			

TWO-WAY STOP CONTROL SUMMARY								
General Information				Site Information				
Analyst	JAG			Intersection	Rt 94 & Meadowbrook West			
Agency/Co.	TMA			Jurisdiction	Town of Cornwall			
Date Performed	5/20/03			Analysis Year	Build Sensitivity			
Analysis Time Period	PM Peak Condition							
Project Description Meadowbrook Estates								
East/West Street: Route 94				North/South Street: Meadowbrook Road				
Intersection Orientation: East-West				Study Period (hrs): 0.25				
Vehicle Volumes and Adjustments								
Major Street	Eastbound			Westbound				
Movement	1	2	3	4	5	6		
	L	T	R	L	T	R		
Volume	0	515	2	6	644	0		
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.87	0.87	0.87		
Hourly Flow Rate, HFR	0	635	2	6	740	0		
Percent Heavy Vehicles	0	—	—	0	—	—		
Median Type	Undivided							
RT Channelized			0			0		
Lanes	0	1	0	0	1	0		
Configuration			TR	LT				
Upstream Signal		0			0			
Minor Street	Northbound			Southbound				
Movement	7	8	9	10	11	12		
	L	T	R	L	T	R		
Volume	1	0	6	0	0	1		
Peak-Hour Factor, PHF	0.58	0.58	0.58	0.25	0.25	0.25		
Hourly Flow Rate, HFR	1	0	10	0	0	0		
Percent Heavy Vehicles	0	0	0	0	0	0		
Percent Grade (%)	0			0				
Flared Approach		N			N			
Storage		0			0			
RT Channelized			0			0		
Lanes	0	0	0	0	0	0		
Configuration		LR						
Delay, Queue Length, and Level of Service								
Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT		LR				
v (vph)		6		11				
C (m) (vph)		956		406				
v/c		0.01		0.03				
95% queue length		0.02		0.08				
Control Delay		8.8		14.1				
LOS		A		B				
Approach Delay	—	—	14.1					
Approach LOS	—	—	B					

TWO-WAY STOP CONTROL SUMMARY									
General Information					Site Information				
Analyst	JAG				Intersection	Orrs Mill / Jackson			
Agency/Co.	TMA				Jurisdiction	Town of Cornwall			
Date Performed	5/20/02				Analysis Year	Build Sensitivity			
Analysis Time Period	PM Peak Hour								
Project Description <i>Meadowbrook Estates</i>									
East/West Street: <i>Orrs Mill Road</i>					North/South Street: <i>Jackson Avenue</i>				
Intersection Orientation: <i>East-West</i>					Study Period (hrs): <i>0.25</i>				
Vehicle Volumes and Adjustments									
Major Street	Eastbound			Westbound					
Movement	1	2	3	4	5	6			
	L	T	R	L	T	R			
Volume	13	108	3	2	172	163			
Peak-Hour Factor, PHF	0.72	0.72	0.72	0.77	0.77	0.77			
Hourly Flow Rate, HFR	18	149	4	2	223	211			
Percent Heavy Vehicles	1	—	—	1	—	—			
Median Type	Undivided								
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration	LTR			LTR					
Upstream Signal		0			0				
Minor Street	Northbound			Southbound					
Movement	7	8	9	10	11	12			
	L	T	R	L	T	R			
Volume	2	44	8	89	33	28			
Peak-Hour Factor, PHF	0.81	0.81	0.81	0.83	0.83	0.83			
Hourly Flow Rate, HFR	2	54	9	107	39	33			
Percent Heavy Vehicles	0	0	0	5	5	5			
Percent Grade (%)	10			-2					
Flared Approach		N			N				
Storage		0			0				
RT Channelized			0			0			
Lanes	0	1	0	0	1	0			
Configuration		LTR			LTR				
Delay, Queue Length, and Level of Service									
Approach	EB	WB	Northbound			Southbound			
Movement	1	4	7	8	9	10	11	12	
Lane Configuration	LTR	LTR		LTR			LTR		
v (vph)	18	2		65			179		
C (m) (vph)	1131	1434		427			435		
v/c	0.02	0.00		0.15			0.41		
95% queue length	0.05	0.00		0.53			1.98		
Control Delay	8.2	7.5		14.9			18.9		
LOS	A	A		B			C		
Approach Delay	—	—	14.9			18.9			
Approach LOS	—	—	B			C			

HCS2000™ DETAILED REPORT												
General Information						Site Information						
Analyst JAG						Intersection Route 94 & Jackson Avenue						
Agency or Co. TMA						Area Type All other areas						
Date Performed 5/20/03						Jurisdiction Town of Cornwall						
Time Period PM Peak Hour						Analysis Year Build Signal Sensitivity						
Project ID Meadowbrook Estates												
Volume and Timing Input												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of lanes, N_i	0	1	0	0	1	0	0	1	0	0	1	0
Lane group	LTR			LTR			LTR			LTR		
Volume, V (vph)	89	448	36	57	521	65	72	61	43	25	52	109
% Heavy vehicles, %HV	0	0	0	0	0	0	0	0	0	0	0	0
Peak-hour factor, PHF	0.87	0.87	0.87	0.86	0.86	0.86	0.84	0.84	0.84	0.92	0.92	0.92
Pretimed (P) or actuated (A)	P	P	P	P	P	P	P	P	P	P	P	P
Start-up lost time, l_i		2.0			2.0			2.0			2.0	
Extension of effective green, e		2.0			2.0			2.0			2.0	
Arrival type, AT		3			3			3			3	
Unit extension, UE		3.0			3.0			3.0			3.0	
Filtering/metering, I		1.000			1.000			1.000			1.000	
Initial unmet demand, Q_b		0.0			0.0			0.0			0.0	
Ped / Bike / RTOR volumes	0		0	0		0	0		0	0		0
Lane width		12.0			12.0			12.0			12.0	
Parking / Grade / Parking	N	0	N	N	0	N	N	-2	N	N	2	N
Parking maneuvers, N_m												
Buses stopping, N_B		0			0			0			0	
Min. time for pedestrians, G_p	3.2			3.2			3.2			3.2		
Phasing	EW Perm	02	03	04	NS Perm	06	07	08				
Timing	G = 35.0	G =	G =	G =	G = 15.0	G =	G =	G =				
	Y = 5	Y =	Y =	Y =	Y = 5	Y =	Y =	Y =				
Duration of Analysis, $T = 0.25$						Cycle Length, $C = 60.0$						
Lane Group Capacity, Control Delay, and LOS Determination												
	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Adjusted flow rate, v	658			748			210			202		
Lane group capacity, c	901			988			355			407		
v/c ratio, X	0.73			0.76			0.59			0.50		
Total green ratio, g/C	0.58			0.58			0.25			0.25		
Uniform delay, d_1	9.1			9.3			19.8			19.3		
Progression factor, PF	1.000			1.000			1.000			1.000		
Delay calibration, k	0.50			0.50			0.50			0.50		
Incremental delay, d_2	5.2			5.4			7.1			4.3		
Initial queue delay, d_3												
Control delay	14.3			14.7			26.9			23.5		
Lane group LOS	B			B			C			C		
Approach delay	14.3			14.7			26.9			23.5		
Approach LOS	B			B			C			C		
Intersection delay	16.9						Intersection LOS			B		

Attachment E
REVISED FIGURE 10

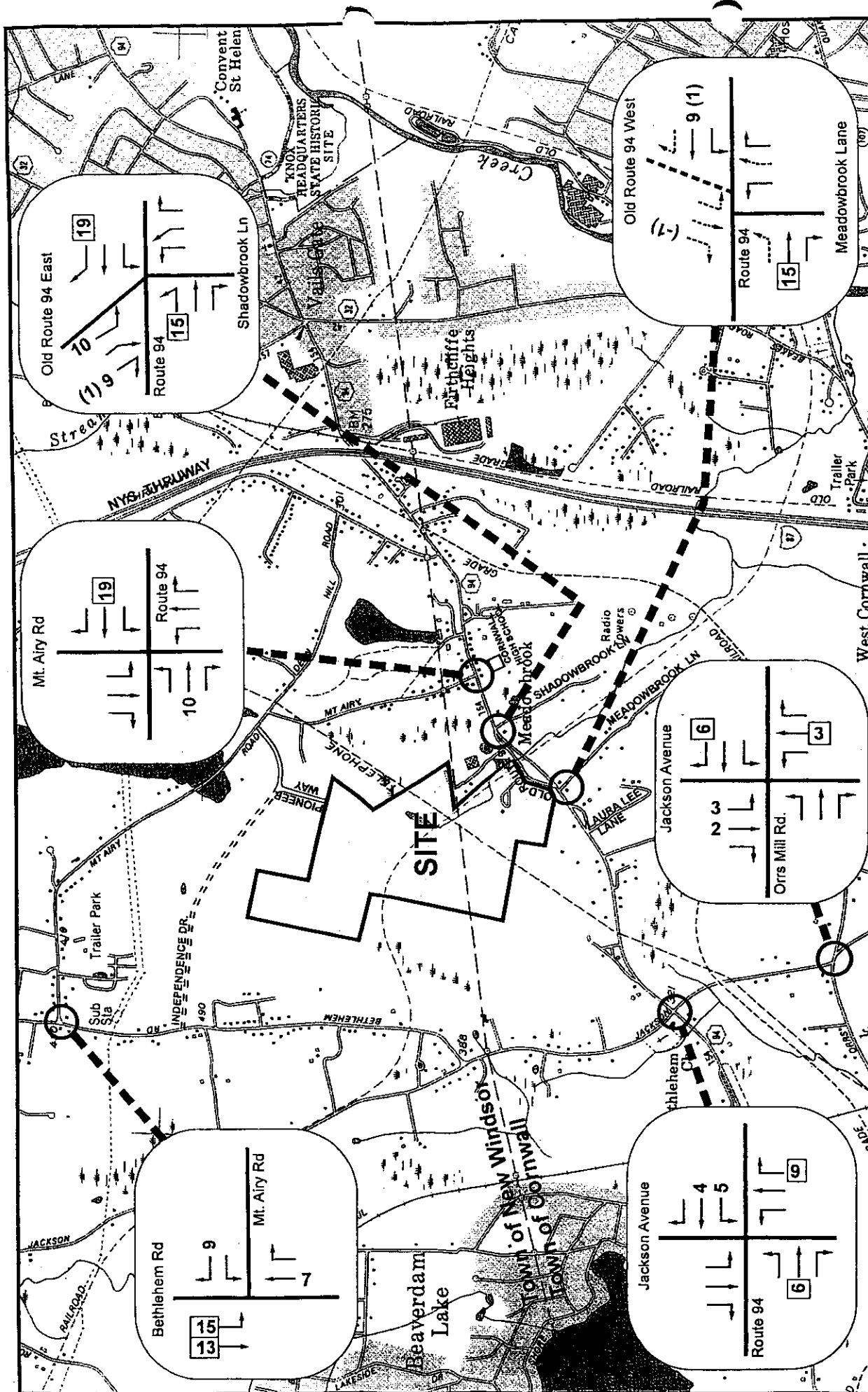


Figure 10: Site Generated PM Peak Hour Traffic
 Meadowbrook Estates
 Towns of New Windsor and Cornwall, Orange County, New York
 Base Map: NYSDOT Cornwall Planimetric Quad Map, 1985
 Scale: 1" = 200'

- Intersections Studied
- XX Inbound Traffic
- XX Outbound Traffic
- (1) Rerouted Trip from Road Closure
- Movement To Be Eliminated

